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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,389	01/22/2002	Anton Sonntag	1748X/50832	6970

500 7590 09/11/2003

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EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 09/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicati n N .

10/051,389

Applicant(s)

SONNTAG ET AL.

Examiner

Dah-Wei D. Yuan

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) 5-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All   b) ☐ Some \*   c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**METHOD FOR CONTROLLING THE QUALITY OF THE COOLANT  
FOR FUEL CELL SYSTEMS**

Examiner: Yuan

S.N. 10/051,389

Art Unit: 1745

September 8, 2003

***Election/Restrictions***

1. Applicant's election without traverse of Group I-1, claims 1-4, in Paper No. 8 is acknowledged. Claims 5-9 are withdrawn from consideration.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1,4 are rejected under 35 U.S.C. 102(e) as being anticipated by Hortop (US 6,582,840 B2).

With respect to claim 1, Hortop teaches a method and apparatus for detecting leakage current in the coolant of a fuel cell stack. Leakage current flowing through the coolant can cause short circuiting, induce galvanic corrosion, electrolyze the coolant and reduce engine efficiency. Over time, the internal heat exchange faces of the bipolar plates begin to dissolve. The dissolution of small parts of material from the bipolar plates into the coolant, such as water, antifreeze, or mixtures thereof, can cause the coolant to become excessively conductive, resulting in excessive leakage current. Hortop further discloses the resistivity of the coolant is

calculated by measuring the stack voltage from the positive terminal of the stack to the negative terminal of the stack, calculating the resistance of the coolant, and using the resistance of the coolant and the physical parameters of the system to calculate the resistivity of the coolant from the resistance. Once the resistivity is calculated, the conductivity can also be calculated by taking the reciprocal of the resistivity. See Abstract, Column 2, Lines 7-19; Column 3, Lines 6-14.

With respect to claim 4, Hortop teaches the use of a controller or the implementation of a software in the main vehicle electronic control module to provide engine control diagnostic and maintenance operations. In one embodiment, if the coolant voltage (resistivity) read is less than or equal to a predetermined voltage level, the report could be a signal the controller can use to shut down the fuel cell operation. See Column 4, Line 58 to Column, Line 5; Column 6, Lines 3-11.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2,3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hortop (US 6,582,840 B2) as applied to claims 1,4 above.

Hortop disclose a method for determining the quality of a fuel cell system as described above in Paragraph 3. Hortop further teaches the use of another predetermined voltage (resistivity) level to provide an alarm or other signal, prior to the coolant reaching an excessively conductive level. The report could be an external alarm or some other diagnostic signal generated by the controller indicating a warning of the increase in conductivity. However, Van Hortop does not teach the controller to signal a need for replacement of coolant. It is well known in the art that replacement of the coolant in the cooling system is an effective way to restore the integrity and function of the coolant. Therefore, it would have been obvious to one of ordinary skill in the art to deliver a coolant replacement signal in the fuel cell system when the resistivity of the coolant is below a predetermined level. See Column 6, Lines 29-54.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (703) 308-0766. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Dah-Wei D. Yuan  
September 8, 2003

  
CAROL CHANEY  
PRIMARY EXAMINER